

The background of the slide features a close-up, artistic rendering of several red blood cells. The cells are depicted as bright red, biconcave discs with a glowing, three-dimensional appearance. They are scattered across the frame, with some in sharp focus and others slightly blurred, creating a sense of depth. The overall color palette is dominated by deep reds and dark reds, with the white text providing a high-contrast foreground.

Childhood Lead Poisoning: Translating Science into Practice

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Collaboration

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Objectives

- Review Lead history, sources, & toxicant
- Explain New CDC “Reference Value”
- Examine scope of problem
- Identify Vulnerable populations & clinical Impact
- Describe translating science into practice
- Promote Primary Prevention & collaboration

A vertical strip on the left side of the slide shows a microscopic view of several red blood cells. They are biconcave discs, appearing as bright red, slightly irregular spheres with a darker center, set against a dark background.

Lead History



Lead characteristics

- Natural element
- Among 1st metal known
- Beneficial economic uses
- Non biodegradable
- U.S. 3rd largest producer

Lead sources

- Pre-1978 housing
- Vintage children's products
- Printing ink
- Plumbing, water pipes
- Cosmetics & >400 lipsticks



Lead ~ Poisonous

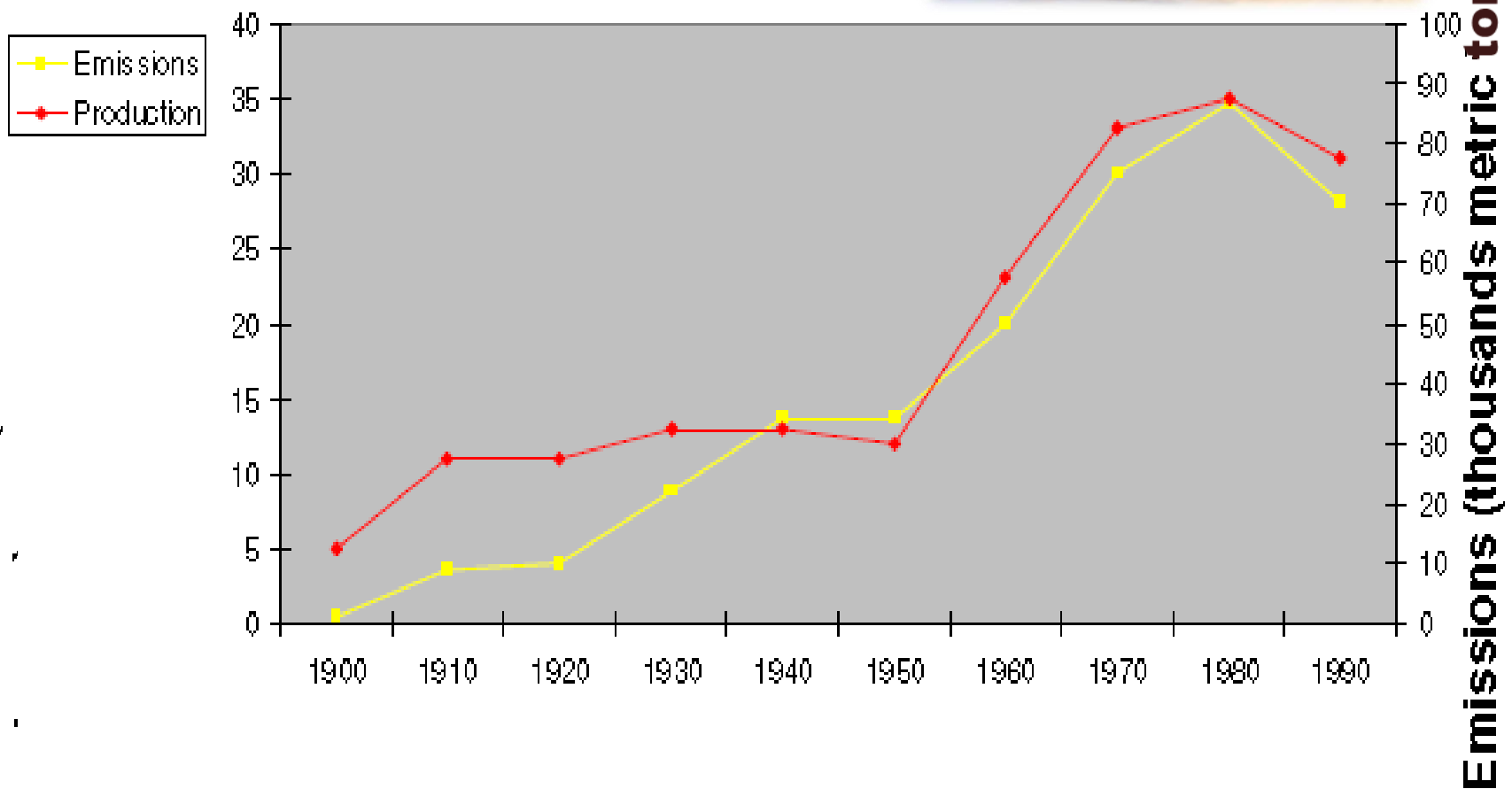
- #1 Environmental threat
- Toxic to humans
- Ingested & Inhaled
- Any Microgram of lead per deciliter of blood(mcg/dL or $\mu\text{g}/\text{dL}$)




LEAD PRODUCTION IN THE 20TH CENTURY



Production (millions metric tons)




Emissions (thousands metric tons)

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Coalition to Prevent Lead Poisoning Rochester, New York

<https://www.youtube.com/watch?v=C0HnWFrQlo4>



New “Reference Value” 5 mg/dL

- CDC criteria based on housing statistics & BLL elevation
- New ~ Provider & Public Health action levels

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Scope of Problem



Scope of Problem

- 535,000 U.S. children BLL's ≥ 5 mcg/dL ages < 6 years
- Poverty & substandard housing disproportionately \uparrow lead exposure risk
- Annual US costs $> \$50$ billion
- Individual cost \$5,600

Older Homes are More Likely to Contain Lead-Based Paint

Year Home Was Built

Between 1960-1977 24%



Between 1940-1959 69%

Before 1940 87%


0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Erie County, NY



- Pre-1978 housing >82%
- 343,879 homes contain lead hazards
- Highest US child lead poison rate
- Poverty level 22.5% children ages <5



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Vulnerable Population & Clinical Impact



Vulnerable Population

~Children~

- Ages <6 yrs.
- Frequent hand to mouth activity
- Rapid lead absorption
- Levels peak between ages 18-36 mos.

Mouthable Surface



Lead Metabolized

Absorbed

- Blood (RBC)
- Soft tissue
- Mineralizing tissues

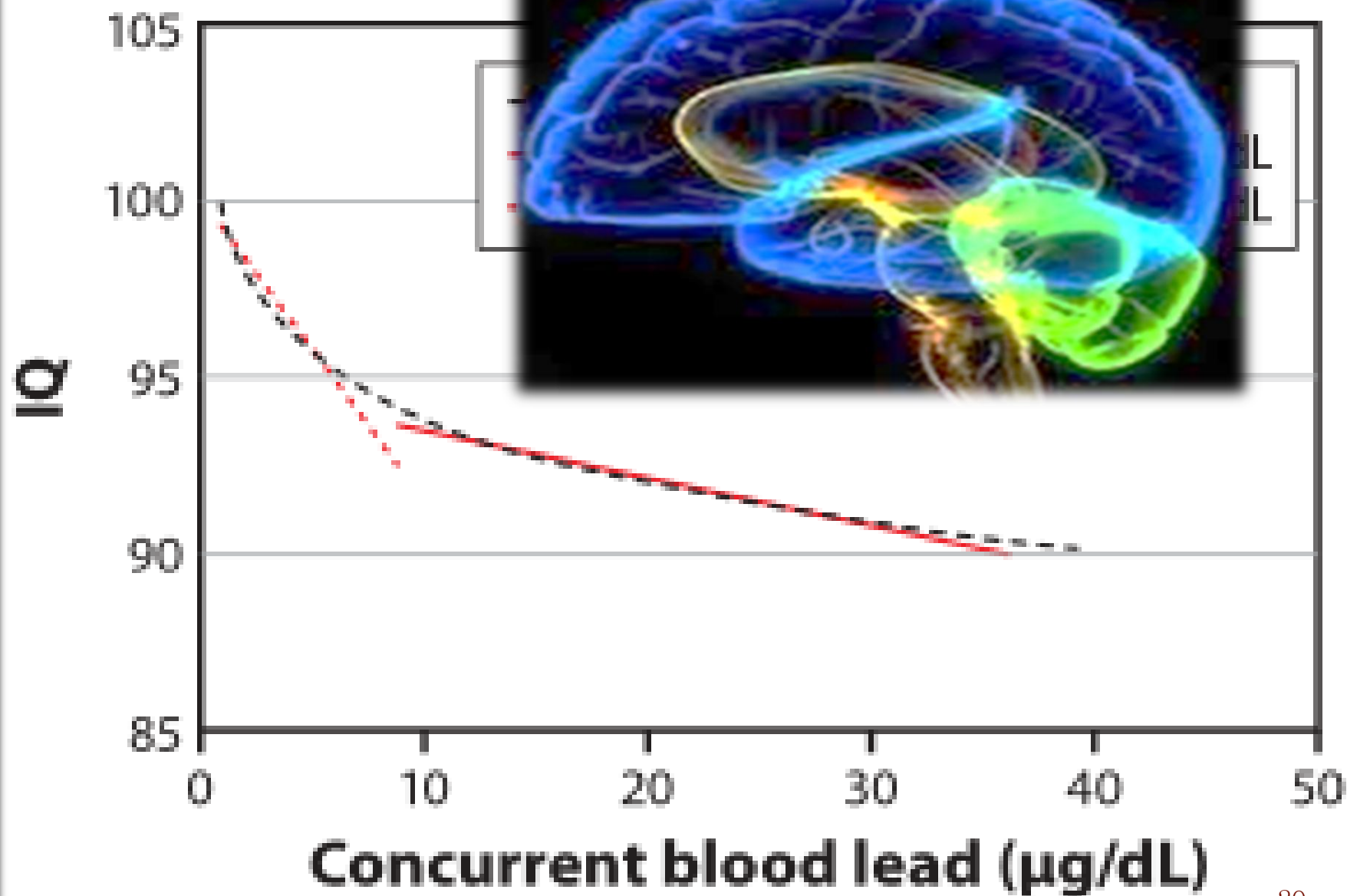
Half life

- 25 to 40 days
- 40 days
- Up to 30 years



Clinical Impact Lead < 10 mcg/dL

- Central Nervous System impairment
- Attention deficit hyperactivity disorder-ADHD
- Cognitive deficits
- Hearing loss
- Lower academic achievement
- Impaired Neurobehavioral development
- Delayed puberty
- Reproductive impairment



Prenatal Lead Exposure



- Cross maternal fetal blood supply 5 mcg/dL
- Deleterious to fetal brain, liver & bones
- Infant premature, low birth weight
- Impaired milestones 1st year & life-long



Additional lead exposed populations

- Adults – lead smelters, welders, recycled batteries, Auto repair, construction & Industrial workers
- Refuge/Immigrant population – Ayurvedic & traditional medicines, candy, spices & cultural cosmetics

Lead Contaminants



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Translating Science to Practice

Translating Science → Practice

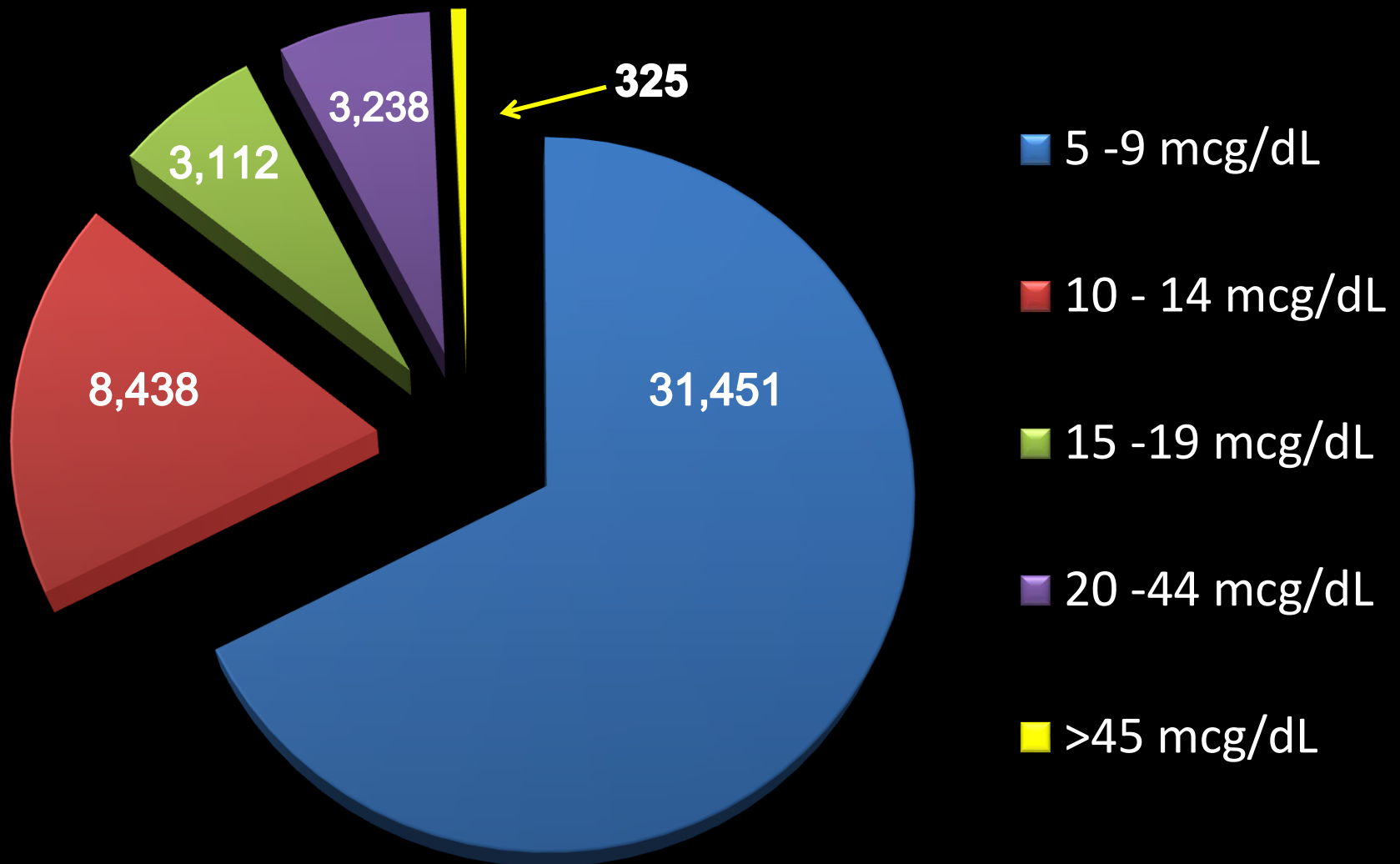
Barriers

- Insufficient time to implement new science
- Cost
- Difficult to change current practice model
- Provider resistance to change

Operationalize

- Current NYSDOH practice risk assessment <6 yrs.
- Blood test-reimbursable (non Ins.- ECDOH)
- Wall posters & guides
- Demonstrate adverse health effect to missed opportunities of past practices

Erie County, NY 10 year (2004 - 2014) childhood blood lead test elevations





Primary Prevention

- Birthing hospitals-Lead Prevention Info.
- Universal lead test ages 1 & 2
- Assess all children ages 6 mos.- 6yrs during routine well-child & ED visits
- Provide anticipatory guidance
- Test all foreign-born up to age 16 yrs.

New York State Department of Health Guidelines for the Identification and Management of Lead Exposure in Children

New York State Public Health Law and Regulations Require Health Care Providers to:

- **Test all children at age 1 year and again at age 2 with a blood lead test.**
- **Assess all children ages 6 months to 6 years at every well child visit** for risk of lead exposure (use assessment questions below), and **obtain a blood lead test** if there is a positive response to any of the questions.
- **Provide anticipatory guidance to all parents** of children less than 6 years old as part of routine care. Use parent handout, "What Your Child's Blood Lead Test Means," (see New York State Department of Health (NYSDOH) website: www.health.ny.gov/publications/2526/).

Additional New York State Department of Health (NYSDOH) Testing Recommendations:

- **Test all foreign-born children up to age 16 years**, particularly refugee and internationally adopted children, upon arrival in the U.S and again 3-6 months after they obtain permanent residences.
- **Test children of any age if lead exposure is suspected.** All children found to have elevated blood lead levels regardless of age require follow-up services (see reverse).

Lead Exposure Risk Assessment Questions for All Children Less than 6 Years

- ☐ 1. **Does your child live in or regularly visit an older home/building with peeling or chipping paint, or with recent or ongoing renovation or remodeling?** New York City banned lead-based paint for residential use in 1960. In 1977, the U.S. Consumer Product Safety Commission banned the use of lead-based paint in residential buildings. Older dwellings may have lead-based paint under new paint. Consider day care, preschool, school, and home of babysitter or relative. Ask if any move, repair, or renovation is planned and provide anticipatory guidance if needed. Children with Medicaid, those entering foster care, and recently arrived refugees are more likely to live in older, poorly maintained housing, and have higher rates of lead poisoning.
- ☐ 2. **Has your child spent any time outside the U.S. in the past year?** All foreign-born children should be tested upon arrival in the U.S., due to higher lead risk in many foreign countries.
- ☐ 3. **Does your child have a brother/sister, housemate/playmate being followed or treated for lead poisoning?**
- ☐ 4. **Does your child eat non-food items (pica)? Does your child often put things in his/her mouth such as toys, jewelry, or keys?** Children with developmental disabilities are at higher risk for pica. Product recall info: www.cpsc.gov
- ☐ 5. **Does your child often come in contact with an adult whose job or hobby involves exposure to lead?** E.g., house painting, plumbing, renovation, construction, auto repair, welding, electronics repair, battery recycling, lead smelting, jewelry, stained glass or pottery making, fishing (weights), making or shooting firearms, or collecting lead or pewter figurines.)
- ☐ 6. **Does your family use traditional medicine, health remedies, cosmetics, powders, spices, or food from other countries?** Lead has been found in items such as: Ayurvedic medicines, alcohol, azarcon (alarcon, luiga, rueda, coral), greta, litargirio, ghasard, pay-loo-ah, bala goli, Daw Tway, Daw Kyin; in cosmetics such as kohl, surma, and sindoor; and in some candies and other products from Mexico. More information available at: www.cdc.gov/nceh/lead/tips/sources.htm
- ☐ 7. **Does your family cook, store, or serve food in leaded crystal, pewter, or pottery from Asia or Latin America?** Lead exposure risk from pottery is higher with: old, cracked/chipped, and painted china; low-fired or terra cotta pottery from Latin America or the Middle East. Also, imported samovars, urns, and kettles could be soldered with lead.

Resources

NYSDOH Website www.health.ny.gov/environmental/lead: Educational materials; management guidelines; CPSC lead hazard recalls; NYS regulations; statistics; and contact information for the following New York State and local resources:

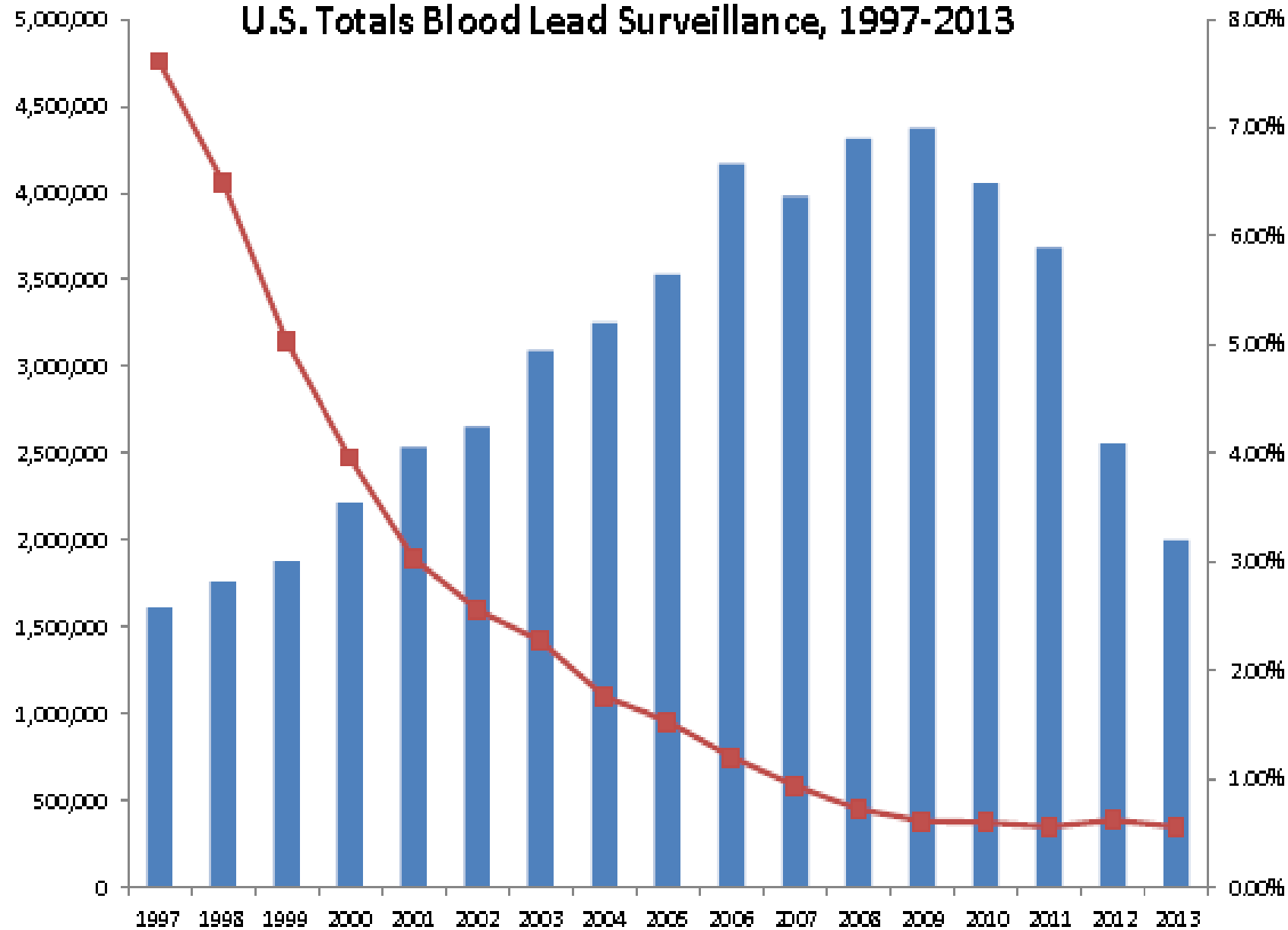
- **Local Health Departments (LHDs)**: LHD follow-up services may include, depending on blood lead level (BLL), parent education, environmental investigation, nutritional and developmental assessment, BLL monitoring, service coordination.
- **Regional Lead Resource Centers (RLRCs)**: Consultation, referral, technical assistance for care of lead-poisoned child.
- **Children's Environmental Health Centers**: Consultation for pregnant women and children with suspected or known exposures to environmental toxins.

Multi-level Lead Prevention Strategy

- ✓ Congress & Federal Laws
- ✓ Clean & healthy NY
- ✓ CDC/Public Health Laws
- ✓ Health Care Providers
- ✓ Agency for Toxic Substances & Disease Registry
- ✓ State & LHD & LRC
- ✓ US Food & Drug Administration
- ✓ Occupational Safety & Health Admin
- ✓ Child Safety Protection Act
- ✓ In **1974** - Safe Drinking Water Act
- ✓ **1978** lead-based paint ban
- ✓ **1996** leaded-gas ban
- ✓ Environment Protection Agency - Regulations
- ✓ Clean Air Act-lead smelters
- ✓ Consumer Product Safety Improvement Act of **2008** (CPSIA)
- ✓ HUD Lead Regulations
- ✓ National screening programs

U.S. Totals Blood Lead Surveillance, 1997-2013

Number of children tested



Confirmed BLLs ≥ 10 $\mu\text{g/dL}$ as % children tested

New CDC Recommendations

*Reference Value BLL (mcg/dL)	Health Care Provider	ECDOH	WNYLRC Consultation:
BLL < 5	<ul style="list-style-type: none"> ✓ Repeat BLL in 6-12 mos. if at risk ✓ Anticipatory guidance 	<ul style="list-style-type: none"> ✓ No action ✓ Consultant 	<ul style="list-style-type: none"> ✓ No action
BLL 5 - 9	<ul style="list-style-type: none"> ✓ Repeat FS BLL in 3-6 mos. ✓ Repeat sooner during warm mos. ✓ Consider MVI ✓ Provide nutritional guidance ✓ Monitor Development ✓ Anticipatory guidance 	<ul style="list-style-type: none"> ✓ Home inspection ✓ Risk reduction ✓ Parent education ✓ Consultation 	<ul style="list-style-type: none"> ✓ No action

LEAD CARE II



- In-office capillary testing & Immediate results
- Cost effective
- Requires venous confirmatory ≥ 8 mcg/dL
- Report results to NYSIIS or ECLR < 2 wks.

Review NYSDOH guidelines

BLL (mcg/dL)	Health Care Provider	ECDOH	WNYLRC Consultation:
BLL \geq 25	<ul style="list-style-type: none"> ✓ Repeat or confirm Blood lead test - 1 mo ✓ Developmental Assessment ✓ MVI ✓ Risk reduction ✓ Health education ✓ Anticipatory guidance 	<ul style="list-style-type: none"> ✓ Consult ✓ NCM ✓ Home inspection 	✓ Consultation

Review NYSDOH guidelines

BLL(mcg/dL)	Health Care Provider	ECDOH	WNYLRC Consultation:
BLL ≥ 45	<ul style="list-style-type: none"> ✓ Repeat or confirm Blood lead test within 48hrs. ✓ Blood test-Zinc Protoporphyrin (ZPP) or Free Erythrocyte Protoporphyrin (FEP) & CBC ✓ Educate-CHOB admit, AXR, & *Chelation therapy ✓ Post CHOB D/C freq. BLL's, MVI & Developmental Eval. 	<ul style="list-style-type: none"> ✓ Urgent consult ✓ NCM ✓ Urgent home inspect. 	<ul style="list-style-type: none"> ✓ Immediate consult ✓ CHOB admit – AXR, blood lab. & Chelation therapy

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Collaboration



Providers - ECDOH - WNYLRC

- Provides children lead elevations medical & environmental intervention
- Child lead program - WNY **(716) 961-6800**
- Erie-Niagara-Chautauqua lead primary **grant**
- Continual collaboration - Medical Director of Western New York Lead Resources:
Dr. Melinda Cameron, MD (716) 878-7324



State & Local Health Departments

- Laboratories
- NYSDOH
- Childhood Lead Poisoning Prevention

Program:

- Nurse case manager
- Health education
- Service coordination
- Environmental coordination

ECDOH Environmental Lead Prevention



- **Childhood Lead Poisoning Prevention Program:** Action levels ≥ 15 mcg/dL
- **Lead Primary Prevention:**
Action levels 5-14 mcg/dL
Nine zip codes:
14201 14207 14208
14209 14210 14211
14212 14213 14215
(Healthy neighborhood – 14206 14206 14218)
- **Lead Hazard Control Program**

Conclusion



- Prolonged low-level lead
Chronic damage to
potentially every organ
- NO treatment exist to
reverse adverse health
- NO safe lead threshold
- Science to Practice
Primary Prevention
“Public Health Priority”

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- Product recall info: www.cpsc.gov
- Google images

Questions?

